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PROBLEMS AND PROJECTS*

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A critical study of the literature on the project method as applied particularly to the teaching of the arts and sciences seems to show that no clear-cut distinction is made between the project and the problem method of teaching. Woodhull, for instance, in a recent article discussing the methods of science teaching makes none, and, indeed, it would be quite fair to interpret him as using the terms synonymously, for he compares the project or problem with the topic and it is clear that he uses the terms interchangeably. Again in the same article he states: "The present need of the schools is for a large collection of sample projects, or problems, which may be used in showing teachers in a given community how to devise and utilize projects adapted to different grade of pupils in their own environment."¹

THE PROBLEM-PROJECT METHOD

There is a tendency, too, on the part of some writers, to use an expression which will not make it necessary to separate clearly and distinctly the terms project and problem. The expression which is used is the "problem-project method of instruction."

Hosie uses the term problem-project to describe certain teaching situations, which for the present writer would constitute projects. Hosie would consider the term project, adequate if it were not so closely identified with certain shop and laboratory practices. The term, problem, he believes, is inadequate because it suggests a purely intellectual process. The problem-project appears to be more satisfactory for Hosie because this compounded term emphasizes both thinking and doing, and points to an objective result.

The writer is in sympathy with Hosie's effort to include in the concept, project, the idea of a problem. It is rather unfortunate, however, that this was done by the use of the term problem-project because of the usual confusion in the use of these two terms. Hosie does not confuse the meanings of the terms, project and problem, neither does he use them synonymously. The teaching

¹Woodhull, John F. The Aims and Methods of Science Teaching. *General Science Quarterly*, Vol. 2, p. 250, Nov. 1917.

*A paper read before the Superintendent's and Principals' Association of Northern Illinois held at DeKalb May 2, 1919.

situation, which he describes as the problem-project, is designated the project by the writer. Hosié's use of the term, problem, is identical with the writer's, to be described later.

In a recent article by Lull on the problem and project method, the author makes no effort to present a clear-cut distinction between these two terms. He makes the point, however, that Kilpatrick "holds that problem instruction is a special case of project instruction." The following statement by Lull indicates that he recognizes some difference in meaning between the two concepts. "Alternative suggestions arise in case of the problem as to whether one means or another shall be chosen to relieve a difficulty or to reach a definite end. Or it may be that the choice of an end is in doubt. In either case, there are perplexing difficulties, and before a choice can be safely made, there must be further investigation. Finally, at least a tentative choice is made of a certain line of procedure or of a certain end to work for, and the work proceeds on the basis of this choice until it is shown to be leading the wrong way. Again, the problem is predominately a matter of explanation or interpretation, while the project is in the main a matter of planning to do something and doing it."¹

Since there seems to be no sharply drawn distinction between the project and problem as interpreted by some of the leading advocates and writers on the project method, it will be necessary, for the sake of clarity and for educational practice, to set up definitions which may make it possible to distinguish these two concepts.

DEFINITIONS OF PROBLEM AND PROJECT

The definition of the problem as proposed by John Dewey is quite adequate: "Every conscious situation involving reflection presents a distinction between certain given conditions and something to be done with them; the possibility of a change. This contrast and connection of the given and the possible confers a certain problematic, uncertain aspect, upon those situations that evoke thought. There is an element, which may be slight or which may be intense, of perplexity, of difficulty, of confusion. The need of clearing up confusion, of straightening out an ambiguity, of overcoming an obstacle, of covering the gap between things as they are and as they may be when transformed, is, in germ, a problem."²

¹Lull, Herbert G. Project-Problem Instruction. *School and Home Education*. Vol. 28, p. 79. 1918.

²Dewey, John. Problem, *Cyclopedia of Education*.

The definition of the project, which the writer proposes for substantiation, may be stated. *A project is a problematic act carried to completion in its natural setting.*

In this definition note that (1) it implies an act carried to completion as against the passive absorption of information; (2) it develops the problematic situation demanding reasoning rather than merely the memorizing of information; (3) it implies by emphasizing the problematic aspect, the priority of the problem over the statement of principles; and (4) it makes provision for the natural setting of problems rather than an artificial setting.³

THE DIFFERENCE BETWEEN PROJECTS AND PROBLEMS

The provision for the natural setting of the teaching situation is the distinct contribution of the project concept. For the sake of added definiteness it may be well to elaborate this point.

This question must be answered in determining whether the setting is artificial or natural: Is the problem presented for solution by schoolroom practice essentially different from that found in life outside the school? If the solution is carried on in the same way and for the same purpose, then the problem has a natural setting, even though it is being solved in the school.

The boy in an agricultural course, who determines to test his father's seed corn as a part of the school work, is carrying on the problem in a similar setting and for the same purpose as if he were doing it as a part of the day's work on the farm. The girl in household science, who becomes interested in the canning of fruit for the home as a part of the school work, is likewise carrying on the problem in its natural setting. The making of soap, the testing of baking powder, taking charge of the interior decoration, with the home interest in mind, are problems in their natural setting. The student who finds in "Ivanhoe" romantic interest as his incentive to read it, rather than as a school requirement, is actuated by the same motive that prompts the general reader; both are attacking the task in its natural setting.

The term problem is largely "intellectualistic in its connotation"¹ and if it were used exclusively it would have a tendency "to over-emphasize the intellectualistic aspect of school work."¹ The project, on the other hand,

³Stevenson, John Alford. *The Project in Science Teaching. School Science and Mathematics.* Vol. 19, p. 57.

¹Kilpatrick, W. H. *How Shall We View Method?* (Unpublished article.)

lays emphasis not only on the problematic situation, but also on the act and its being carried to completion. The project makes provision for the natural setting of the teaching unit. Without the natural setting there is no project. The problem setting is artificial, that is, it is not approximately a life situation. The project may be considered as the normal life situation, or the problem in its natural setting.

The foregoing view is indicated by Kilpatrick in the following statement. "It is at once evident that every problem which is accepted for prosecution in the sense that its solution is willed *ex vi termini* a project. In this sense every real problem is a project, but not every project is a problem; the problem method accordingly becomes a special case—a most important one to be sure of the project."¹

This same view of the project and problem is shared by Miss Krackowizer.

"Children's lives are full of activity. They are constantly carrying out projects and solving problems of their own. In the process of living they learn to think, because of the fact that in their activity they are most often carrying out a definite purpose; that in order to do so they must weigh and judge among ideas and material details, and select from among these the ones most pertinent to the fulfillment of their immediate end; that in working out their definite purpose, they meet difficulties which need to be overcome before the desired end can be obtained.

"Since this is the method of procedure of a normal child or of any normal human being when under no constraint, the school should adopt it. 'Purposeful activity' on the part of the children then becomes the aim of the school. The teacher's part is to guide towards such 'purposeful activities' as will prove of greatest benefit to the children, choosing among those directly available for first-hand experience."¹

The following definition of the project is proposed by Miss Krackowizer. "Any 'purposeful activity' determined upon and carried to a successful conclusion becomes a project. She defines the problem as the situation which demands the exercise of choice."¹

The writer uses the expression "natural setting for the problem" in the same sense that Kilpatrick uses real problem. In the writer's definition of project note that the project is made to include the problem, stated as the

¹Krackowizer, Alice M. *Projects in the Primary Grades*. Pp. 15-16. J. B. Lippincott Company, Philadelphia. Pp. 221, 1919.

problematic act. It is quite clear, then, that the project must include a problem.

The apparent difficulty in defining the fields of the project and problem is just what might be expected when the less inclusive term, the problem, covers a large part of the field taken by the more inclusive term, the project. The problem does not make any provision for the natural setting of the teaching situation, while the project does. To make a sharper distinction, we may state that the project differs from the problem in that it involves action in its natural setting. The project carries with it the implication of doing, the problem suggests primarily an intellectual process.

The distinction between problems and projects is well stated by Miss Krackowizer, "The process of carrying out projects and problems includes thoughts, suggestions and activities rejected as well as those finally selected as pertinent. If no steps are taken toward the attainment of a definite purpose, the mental problem may remain in the child's mind, but there is no solution of it and there is no project involved."²

THE MANUAL PROJECT AND THE MANUAL PROBLEM

It should be remembered, however, that the problem is not necessarily confined to the intellectual process. It is quite possible to have problems involving manipulative skill, even physical activity, and yet these may not be considered projects. The following example will illustrate. In introducing the subject of baking powder in a chemistry class, the teacher had the students make tests to determine the amount of carbon dioxide gas given off by equal amounts of the different brands of baking powder.

The whole lesson proved interesting and the results were probably better than those of the average laboratory experiment. The students carried out their problems, and later purchased different brands to repeat the experiment. But while this exercise may have been effective, it is a problem (we could well term it a *manual problem*) and not a project, since the setting was artificial. One of the boys suggested that it might be interesting to determine which brands were economical. Several of the boys and girls then tested the baking powder used at home and compared results with those obtained in the experiment. They then reported to their mothers the efficiency of the different powders and this resulted

²Krackowizer, Alice M. *Projects In the Primary Grades*. Pp. 16-17. J. B. Lippincott, Philadelphia. Pp. 221, 1919.

in some cases in a change by the mother in her purchase. This latter exercise is a project, for it arose in the natural setting, the desire to help or give advice to the mother and the act was carried to completion in its natural setting. (This may be termed a *manual project*.)

THE INTELLECTUAL PROJECT .

Again, it is not necessary that there be physical activity in the project, that is manual activity. While it is true that physical activity is usually considered a part of the project, yet mental acts serve in the sense of activity in our proposed definition just as physical acts. In a course in the "History of Western Europe" the teacher suggested that the events of the great war should be followed. One student noted in his reading the frequent references to the proposed establishment of the country of Poland. He asked the teacher "Why should this particular country be set up?" The teacher replied that this would be a good problem for him to solve, with the result that he read widely, looked up references, and was able to give an accurate account of the three divisions of Poland.

This problem arose in its natural setting—the situation was not essentially different because it was solved in school. It is a problematic act carried to completion in its natural setting. (This may be termed an *intellectual project*).

The manual projects are common in the fields of general science, agriculture, home economics and manual training.

TYPES OF PROJECTS AND PROBLEMS

Four types of projects and problems have been mentioned, the manual problem, the intellectual problem, the manual project and the intellectual project. An illustration of each of these types will be made from the same field of subject matter in order to show clearly their differences.

The subject matter may be centered around the study of the electric bell. If the topic were begun by making an assignment in the text, the student being required to master the lesson as assigned, without regard to the natural setting for the problem it would be an *intellectual problem*. If he were to perform the experiment as outlined and directed in the physics manual, even doing some construction work, this exercise would be classed as a *manual problem*. These are problems because difficulties arose and were solved but not in a natural setting.

The student might become interested in the topic of electric bells, burglar alarms and take up the subject, reading widely, in order to familiarize himself with the details of the bell. He might do this for the same purpose as any one would take on such problems in life outside the school. The teacher might set the stage for such purposeful activities. This method of approach illustrates the *intellectual project*. If this exercise were carried to the point where a bell system were installed, perhaps in the home, bells were constructed and burglar alarm systems were made, this would represent the *manual project*. These are projects because difficulties arose and were solved in a natural setting, that is, the situation was not essentially different from life situations.

The two types of projects are recognized by Miss Krackowizer in the following quotation:

"There are various types of projects. One of these types involves mental processes alone, without manipulation of material and without the necessity of outward expression; this is the problem type. It goes without saying that while this type may exist by itself, it is not likely to do so in the child's world. On the other hand, all other types of projects include the problem type in so far as they are not merely unconscious responses."¹

It must be borne in mind that the *manual problem* and the *intellectual project* are the two concepts which may cause confusion in making the distinction between *projects* and *problems*. The guiding principle is to determine whether the natural setting for the problem exists. If so, the teaching situation is a project.

What is frequently done in school is to take the problems away from their setting in projects, with the resulting tendency to teach them in isolated groups with little thought of their function. To avoid this isolation of elements, a larger unit of work, the project, is undertaken, on a functional basis and carried over into activity.

It is interesting to note that both problems and projects vary widely in the degree of difficulty. The boy who oils a bearing or the boy who determines the efficiency of the dairy herd is in each carrying out a project but the comprehensiveness of the latter is far greater than that of the former. Again the problems vary in complexity. For instance, the finding of the product of 3×6 is less complex than the determination of the relative superiority of the harbors of New York and San Francisco.

CLASSES OF PROJECTS AND PROBLEMS

Since there is such a wide variation in the complexity of the problems and projects and since there are so many situations which these concepts cover, it would seem wise for the sake of educational practice to propose subdivisions which will indicate this degree of complexity.

Problems may be classified as (a) Simple, and as (b) Multi-problems. Projects may be classified as (c) Simple, and (d) Complex.

SIMPLE AND MULTI-PROBLEMS

The simple problem has its place in school. There are many intellectual difficulties that are not complex and yet need to be solved. The teacher may ask such questions as, "Where is Louisiana? Its Capitol? Its resources? Where is Alabama? Its Capitol?" etc. The teacher may ask a number of simple questions concerning the states in the southern group, and since they are in a sense difficulties proposed for solution, they may be considered as simple problems. But on the other hand, instead of proposing for solution a number of these simpler questions, the teacher may propose one large problem, which we call the multi-problem, and which may embrace all these simple problems. Instead of asking many detailed questions about the New England States and the Southern States a multi-problem might be suggested such as the following: Compare the two groups of states in respect to size, location, configuration, population, industries, harbors, agricultural activities, hospitality and labor. Or again, is the Southern group sufficiently large to make a strong nation? Is the New England group?

There are many simple problems that could be proposed for solution in the suggested study of the two groups of states. But in the multi-problem attack on some one complex problem which will involve most of the material and facts covered by the simple problem is selected. "For instance, to quote from an actual case, a superintendent proposed in the geography classes which were studying New England, this question: Might New England have developed into a powerful nation? The solution of this problem, the superintendent reports to be interesting to the children. Several problems arose and all the facts usually taken up by the topical method were utilized. The first minor problem was this: Is New England large enough? The student turned to the appendix of the geography, found the area of the United States, of their native state, and of New England, and decided on the negative. New England was too small.

"But how does it compare in size with some great European nations? was asked.

"The children named several important European countries and finally selected for study the British Isles and particularly England, as the ruling power of the British Isles. Comparisons of area were made.

"The teacher then put the problem: As far as area is concerned, might New England have been a nation? Is New England large enough to become a nation? The class then reversed themselves and decided for the affirmative.

"Then the question was put,—Greenland is twelve times the size of New England. Is it a great nation? The pupils decided that size was not all-important and that they must know whether or not the people could raise what they needed to eat, and to know this they must get facts about soil, seasons, surface, and climate.

"A study of soils was made and a study of the other items of seasons, surface and climate followed. Before the books were opened the children were always asked to hazard opinions about probable nature of soils, seasons, etc. (This took much time because of comparisons made with their native state.) They decided that New England could not feed itself and, also, after protracted study, they decided that New England could not clothe itself. It therefore could not become a great nation.

"But can England feed and clothe itself? The study revealed that it could not. But since she is a great nation, how is this overcome? By trade.

"What could New England trade (from your knowledge of New England already learned)? Products of fisheries, mines, forests, etc.

"Does New England have more fish than it needs for its own use? (A study of fisheries followed and the question was answered affirmatively). So, also, was carried on a careful study of mining, lumber-manufacturing, etc. In each case the children formed their judgment and verified their conclusions."¹

A MULTI-PROBLEM IN ART

Another multi-problem, one in the field of art, may be cited. It was outlined and carried out in the seventh and eighth grades in Grand Rapids under the supervision of Charlotte Calkins. The problem of the two years' work was called the "House Beautiful."

¹Charters, W. W. *Systematic Topics, Multi-problems and Projects*. Paper read before Illinois State Teachers' Association, December 28, 1917.

The problem took up all phases of making the house beautiful. Principles of design, making plans, of the house, selection of the lot, and furnishings were studied.

During the two years which this study was carried on the pupils were brought in contact with most of the problems that arise in making the home beautiful.

It may be said, parenthetically, that for most of the pupils this was a school problem, but that to some of the pupils it became a project. One such project was called to the attention of the writer. A girl's mother was planning to redecorate and refurnish the home. The girl, aided by the supervisor took charge of the undertaking, and in carrying the task to completion developed principles as she needed them. This is, of course, splendid teaching for it applied the art principles in a very concrete, interesting and almost spectacular manner. The whole problem as carried on by Miss Calkins may be classed as a multi-problem. Instead of asking the pupils to solve many detailed and simple problems of art, the large multi-problem "The House Beautiful" was suggested. There were many simple problems and projects involved in this one large multi-problem. It is classed as a problem because it was not in most cases carried to completion in its natural setting.

A MULTI-PROBLEM IN ARITHMETIC

Another interesting multi-problem in the field of arithmetic is reported by Clark. The problem was the mathematics and business practice involved in buying a lot and building a home. Such subjects as legal descriptions of real estate, taxes, building costs of different materials, borrowing money, mortgages, and insurance were studied in connection with the many mathematical problems. This is an interesting method of approach but should not be called a project or a problem-project because the setting is not natural, there is an artificiality about it. This is, however, a valuable exercise and should be given wide publicity but it should not go under the name of project.¹

A MULTI-PROBLEM IN GEOGRAPHY

A significant multi-problem in geography was carried on by Miss Williams in an eighth grade at the Kansas State Normal School. The problem was "To show why the trade of New York is greater than that of San Francisco." The problem was investigated by all the pupils,

¹Clark, J. R. *The Problem-Project in Arithmetic*. Chicago School Journal, Vol. I, pp. 15-16. 1918.

each preparing an outline and suggesting methods of procedure. The things needed in solving the problem were suggested.

“1. The value of trade in money and quantity of trade in tons.

2. Description of the two harbors.

3. Position of the two cities with reference to our country, to foreign countries.

4. Articles of trade.

The various points were discussed in class, references reviewed, and finally the class adopted a series of conclusions.

This is reported as a project-problem, but owing to the fact that there was no provision for the natural setting, it is more accurately classed as a multi-problem.²

SIMPLE AND COMPLEX PROJECTS

Not only do we find simple problems and complex problems, but in like manner we may find simple and complex projects. The girl who accepts the problem of peeling potatoes economically at home may be said to be carrying out a simple project, but her task is much less complex than that of the girl who undertakes as her project the entire preparation of the meals for the family for a period of a month with particular attention to the reduction of cost. The latter is a complex project.

Obviously, it will be very difficult to draw an exact line of demarcation between the simple and complex problems and projects, but this guiding principle may be posited. When the process has sufficient complexity so that it may be broken up into a number of problems or simple projects, it may be classed as complex.

The classification of projects into simple and complex is recognized by C. R. Allen. “‘Projects’ may include major and minor projects, the latter being a subdivision of the former. For example, a boy might undertake to raise an acre of corn as his major project. A minor project connected therewith would be the preparation of the soil or the test of the seed.”¹

In order that the proposed classification will be better understood, a number of simple and complex projects will be cited.

²Williams, Jennie. *Project-Problem Instruction in Eighth-Grade Geography*. Teaching, No. 45. P. 11-15. A journal published by Kansas State Normal School, Emporia, Kansas.

¹Allen, C. R. The Project Method and the Combination of the Project Method with the Phase System. *Massachusetts Board of Education, Bulletin* 75, p. 50.

SIMPLE PROJECTS

The task of sharpening tools, cutting to a line, planing a board, and fitting a joint in the manual training class when carried on in a natural setting may be considered as simple projects. The baking of a loaf of bread, setting the table, serving the meal and going to the meat market to procure a certain cut of meat may be called simple projects in home economics. Making an analysis of soil, testing out varieties of seed corn, spraying the tree with a given mixture, keeping milk records for a week, selecting and preparing seed potatoes, developing plan to remove surface water around farm buildings, treating seeds with formalin, introducing a plan for proper feed rations for cows, swine, etc., carried on in the natural setting, are representative for agriculture. In art, framing a picture according to principles of design, making curtains, the selection of artistic, but inexpensive wall paper, illustrate the simple project.

In composition, writing an invitation, a report of a recent athletic game for the school paper, or a letter illustrate the simple project in composition.

In arithmetic, solving simple problems which arise in connection with some of the home activities, viz, checking over the weekly grocery bill illustrate the simple project.

In industrial education, Allen gives a number of illustrations of the simple project:

“Telling a boy to oil a bearing would constitute a project in its simplest sense, in that that particular boy would be made responsible for the oiling of that particular bearing. Assigning a particular job to a particular boy in the shop of the industrial school involves the setting up of a project, in that that boy is expected to do that job; it is his job, and he is responsible for it. In the discharge of that responsibility he would have to apply certain special knowledge about the construction of bearings, proper methods of lubrication, etc., to that particular job. He would also have to exercise certain skill, and both the application of this special knowledge and skill would have to be carried out with intelligence. Giving a district messenger boy a letter to deliver sets up a project, in that he is expected to deliver that letter to the party to whom it is addressed, and in that way discharge his responsibility. In the discharge of that responsibility he must apply his knowledge of streets, routes, methods of procedure required to reach that individual, whether in a business office, a hotel, a private

house, etc., must exercise skill in avoiding accidents and judgment in the proper performance of his job.”²

COMPLEX PROJECTS

A complex project differs from the simple project only in the degree of complexity. As stated before, it is difficult to draw any sharp line of demarcation between the simple project and the complex. To illustrate the point a little better, projects might be arranged in the order of complexity beginning with the least complex and ending with the most complex suitable to school conditions. The complex projects would consist of the projects in the upper half of this group. At the point in the scale, where the projects were sufficiently complex to be broken up into smaller problems and projects, that point would, in general terms, mark the beginning of complex projects.

COMPLEX PROJECTS IN AGRICULTURE

A number of projects outlined by Stimson in his bulletin on “The Massachusetts Home Project Plan of Vocational Agricultural Education,” illustrates the complex project. The project of constructing a concrete walk might involve a study of the nature of cement; its action on sand, gravel, and broken stone; its resistant qualities to the weather; the seasons in which it might be used; the cost as compared with plank, brick, flagging and asphalt; the mathematical determination of proportions of sand, cement, and stone to be used; the geometrical determination of the sections into which it should be divided, and whether it should be crown or flat; the geographical sources of the raw material and the commercial conditions for purchasing the cement.

“The home project, or part-time plan of instruction, moreover fits in nicely in its relation to the usual farm activities of the boy. The boy may help with the milking throughout his course, where the object is to get the cows milked as quickly as possible and where no records are kept. During certain months of at least one year the school should require whatever time may be necessary for keeping an accurate record in pounds and ounces of the yield of a part of the herd. This may be

²Allen, C. R. The Project Method and the Combination of the Project-Method with the Phase System. *Massachusetts Board of Education* 75, p. 46.

limited to the weighing of milk from a single cow and giving credit for what she produces.”¹

The complex project in agriculture is well illustrated by French under the name “long time projects.”² Such projects as raising an acre or more of corn, taking charge of an entire vegetable garden, an apple orchard, or the poultry for a season, give the scope of complex projects suggested by French.

The student in a class in Modern History who became interested in the map of Europe and decided he would account for the present map undertook a complex project.

A COMPLEX PROJECT CENTERING AROUND PARCEL POST

A very complete complex project centering around the parcel-post by C. W. Stone will be summarized. It has been thoroughly developed and cuts across many subjects in the curriculum. It will serve as a good example of the project worked out fully.

Since the children plan at the holiday season to send packages to distant friends and relatives they naturally are giving consideration to the various ways by which they may be sent. This gives a natural motive for the study of the parcel-post a few weeks before the holidays. This project was undertaken by the fourth grade class in the Iowa Teachers College Training School. “The main purpose was to bring the subject before the children in such a way as to prepare them to use the parcel-post service to the best advantage. Accordingly, it was worked out not only through general discussion in which the entire grade took part, but also in their class work in handwork, geography, arithmetic, and language.”

The available experience which the children had for this project was ability to read and write; a knowledge of simple mathematics, including measurements; some knowledge of places in relation to their own locality; ability to do elementary manual work; they had received packages by parcel-post and had seen the parcel postman delivering packages.

“The main aims which the teacher had in mind were (1) to teach the children how to wrap and address correctly packages to be sent by parcel-post, (2) to teach

¹Stimson, R. W. The Massachusetts Home Project Plan of Vocational Agricultural Education. *U. S. Bureau of Education, Bulletin* 579, pp. 13-15, 1914.

²French, W. H. Home Project in Agriculture for Michigan High Schools and School Credits. Published by the Michigan Agricultural College. *Bulletin* No. 17, 1916.

them what might or might not be sent by parcel-post, (3) to teach them the advantages of parcel-post service, (4) to give them practical problems in arithmetic, (5) to make a beginning of map reading by locating places where packages were to be sent, (6) to give them a larger conception of civic life, (7) to train them in obedience to laws and regulations, and (8) to teach them to help other people.

The rules and regulations of sending packages by parcel-post were worked out by the pupils and teacher, the larger part was suggested by the pupils.

The technique and practice of wrapping packages was carried out in the handwork lesson. Here questions as to the cord and paper to be used and the methods of wrapping different types of articles were developed. Each child selected an article and wrapped it, developing principles as needed. The addressing of the packages with its problems was done in the language class and the study of the parcel-post zones was carried on in the geography class. In the arithmetic class the children were taught to weigh and compute the cost of sending their packages to different zones. After computing the cost, the packages were taken to the postmaster, each member in turn acting as postmaster to purchase stamps. The postmaster then weighed the package, looked up the zone and computed the cost of sending the package, returning the change to the pupil. This work furnished material for practical problems in arithmetic.

Some of the children actually sent packages which they had wrapped in class thereby, testing the results of this exercise.

The package, which furnished the greatest interest, was the one prepared for an orphans' home. The children brought toys from home and made others in the manual training class for the gift. The preparation of this package, the wrapping, packing, and addressing constituted one class exercise. A letter written by one of the members of the class was included, requesting one of the children receiving the package to answer. Since this letter was chosen as the best by a committee it furnished competition, a motive, for the writing of the letter.

The results of this project are summarized by Stone. "The study of the parcel-post has given the children a practical knowledge which will enable them to render assistance at home whenever the need of sending a package by parcel-post may arise. It has been a socializing influence. It has made them more observant of civic relations and has opened their eyes to the possibility

of their being able even as children to bring pleasure to others. The whole series of lessons furnishes a good example of the kind of school work which is a part of actual everyday living.''¹

A COMPLEX PROJECT IN PHYSICS

• The writer, in the high-school course in physics, taught the electric bell and its uses by the project method. Each year one or more of the school buildings had to have the bell system completely overhauled, which meant install new bells, new wires, repair some of the bells, find short circuits, and in many cases make parts for bells or construct complete ones. This project was discussed by the members of the class and leaders were appointed for each phase of the work. The principles of the electric bell were developed as needed in this task. Usually this experiment resulted in bell systems being placed in the homes.

It will be seen that the complex projects proposed have been of sufficient complexity to allow them to be broken up into problems and simple projects.

SUMMARY

It may be restated that *the project is a problematic act carried to completion in its natural setting*. It differs essentially from the problem in that it provides for the natural setting of the teaching unit and lays emphasis on the manual act.

Problems may be classified as (1) intellectual and (2) manual.

Projects may also be classified as (1) intellectual and (2) manual.

On the basis of complexity problems may be classified as (1) Simple and (2) Multi-problems. Projects may be classified as (1) Simple, and (2) Complex.

The multi-problem gives superior training in developing the technique of reasoning and "tends to make facts interesting and significant." The project, particularly the complex project, in addition to developing the technique of reasoning, provides the natural setting for problems and carry the facts into action.

Making provision for the natural setting sometimes may be uneconomical. If so, the problem method is advisable.

¹Stone, C. W. Parcel-Post Project.